MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OPERATING PERMIT TECHNICAL REVIEW DOCUMENT

Permitting and Compliance Division
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Bear Paw Energy, LLC
Baker Gas Plant
SW¼ of the SW¼ of Section 6, Township 7 North, Range 60 East, in Fallon County, MT
1400 16th Street, Suite 310
Denver, Colorado 80202

The following table summarizes the air quality programs testing, monitoring, and reporting requirements applicable to this facility.

Facility Compliance Requirements	Yes	No	Comments
Source Tests Required	X		Semiannual
Ambient Monitoring Required		X	
COMS Required		X	
CEMS Required		X	
Schedule of Compliance Required		X	
Annual Compliance Certification and Semiannual Reporting Required	X		Annual and Semiannual
Monthly Reporting Required		X	
Quarterly Reporting Required		X	
Applicable Air Quality Programs			
ARM Subchapter 7 Preconstruction Permitting	X		Permit #2736-07
New Source Performance Standards (NSPS)	X		40 CFR 60.647(c), Subpart LLL, KKK, recordkeeping and reporting requirements as applicable
National Emission Standards for Hazardous Air Pollutants (NESHAPS)		X	Except for 40 CFR 61, Subpart M
Maximum Achievable Control Technology (MACT)		X	
Major New Source Review (NSR) – includes Prevention of Significant Deterioration (PSD) and/or Non-attainment Area (NAA) NSR		X	
Risk Management Plan Required (RMP)		X	
Acid Rain Title IV		X	
State Implementation Plan (SIP)	X		General SIP

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SECTION I. GENERAL INFORMATION

A. Purpose

This document establishes the basis for the decisions made regarding the applicable requirements, monitoring plan, and compliance status of emission units affected by the operating permit proposed for this facility. The document is intended for reference during review of the proposed permit by the U.S. Environmental Protection Agency (EPA) and the public. It is also intended to provide background information not included in the operating permit and to document issues that may become important during modifications or renewals of the permit. Conclusions in this document are based on information provided in the Title V Operating Permit renewal application submitted by Bear Paw on January 20, 2004, and the de minimis request submitted December 8, 2004.

B. Facility Location

The legal description of the facility is the SW¼ of the SW¼ of Section 6, Township 7 North, Range 60 East, in Fallon County, Montana.

C. Facility Background Information

The Baker Gas Plant occupies a 20-acre rectangular site measuring approximately 900 feet by 950 feet. Local terrain is predominantly flat with a slight down slope from north to south. The surrounding vicinity is also predominantly flat. The prevailing winds are from the west. There are no schools, hospitals, residential areas, or parks located within a ½ mile radius of the plant.

The facility was originally permitted to Western Gas Resources (WGR). In May 1992, WGR applied for a permit to operate their existing natural gas processing plant and associated equipment and to construct a Challenger flare to be used for emergency situations to increase safety at the plant.

On June 28, 1993, WGR Permit **#2736-00** became final and effective. The flare was constructed and placed in operation in October 1993. Also, as a requirement of the permit, WGR was required to install Non-Selective Catalytic Reduction (NSCR) units on the 2 compressor engines to control oxides of nitrogen (NO_x), carbon monoxide (CO), and Volatile Organic Compound (VOC) emissions. The 800-horsepower (hp) White Superior 8G-825 Compressor Engine was permitted, as it existed at the time, with 2 exhaust stacks. In October 1993, the White Superior 8G-825 exhaust stacks were retrofitted into one stack; therefore, only one NSCR unit was required for that source. The NSCR units were then installed in November 1993, and the engines were tested in January 1994.

On February 8, 1995, Permit **#2736-01** became final and effective. The permitting action reflected a modification to remove all references to the second stack on the White Superior 8G-825 compressor engine, change the emission limits to reflect mass emission limits in pounds per hour (lb/hr) rather than grams per horsepower-hour (g/hp-hr), and change the derated horsepower to the rated horsepower. WGR also requested the permit testing language be changed to reflect the updated Montana Source Test Protocol and Procedures Manual. Permit #2736-01 replaced Permit #2736-00.

On December 10, 1993, a lottery was held and WGR's Baker Gas Plant (Permit #2736-01) was selected to submit their Title V operating permit application in the first year. WGR requested that the Baker Gas Plant be removed from the Title V permit list since Permit #2736-01 indicated the total criteria pollutants were less than 100 tons per year.

On August 25, 1996, Permit **#2736-02** became final and effective. Before the Department of Environmental Quality (Department) made a final determination on whether a Title V permit was necessary for this facility, a complete emission inventory of Hazardous Air Pollutants (HAP) emissions was developed and submitted to the Department for review. A complete emission inventory of fugitive VOC was also required since a number of fugitive VOC sources were not identified during the initial permitting action. WGR submitted a permit alteration for all sources of VOCs and HAPs not previously identified in Permit #2736-01. The permit alteration was for the following VOC emission units:

- Fugitive VOC leaks from components in VOC service;
- 4.0 million standard cubic feet per day (MMscfd) ethylene glycol dehydration unit;
- Bottom loading, vapor balance, product loading facility; and
- 3 fixed-roof condensate storage tanks.

Permit #2736-02 replaced Permit #2736-01.

On June 27, 1997, Permit **#2736-03** became final and effective. The permitting action included: a change of ownership from WGR to Bear Paw; a proposed increase in production from 1.4 MMScf per day to 4.2 MMScf per day; a proposal to add an amine sweetening unit and a new Guyed flare to control emissions from the proposed production increase. The proposed amine unit supplemented the previously permitted iron sponge. The alteration also increased sulfur dioxide (SO_2) emissions by 116 tons per year, which resulted from the production increase at the facility. Emissions are controlled by an amine sweetening unit and a new flare. The proposed increase in emissions was below Prevention of Significant Deterioration (PSD) threshold levels and did not trigger PSD. However, the Baker Gas Plant became a Title V source because of the emissions. Permit #2736-03 replaced Permit #2736-02.

The Department received a request from Bear Paw on September 22, 1997, to modify Permit #2736-03. Bear Paw was previously required to route the pressurized tanks to a flare. During the 1997 inspection conducted by the Department, it was discovered that the pressurized tanks were not routed to the flare as required by Permit #2736-03. However, upon further investigation, the Department determined that it did not make sense to have these pressurized tanks routed to the flare because they only vent in emergency situations. Furthermore, the routing could cause venting, which means a direct product loss to the company. Permit #2736-03 was modified by removing the routing language. There was no change in the potential emissions because the emissions inventory did not calculate the tank emissions as being controlled by the flare. Permit **#2736-04** replaced Permit #2736-03.

On September 23, 1998, the Department received a complete application requesting an alteration to Permit #2736-04. Bear Paw requested to add a single 1250-hp Waukesha Compressor Engine or a series of Waukesha Compressor Engines equivalent to 1250-hp. Because the emissions would be the same if there were one or a series of engines, the Department approved this alteration to allow Bear Paw operational flexibility. Permit **#2736-05** replaced Permit #2736-04.

On December 15, 1998, the Department received an operating permit application for the Baker Gas Plant. The application was assigned number OP2736. The permit application was deemed administratively complete on January 3, 1999, and the application was deemed technically complete on February 3, 1999. Permit **#OP2736-00** became final and effective on July 14, 1999.

On September 4, 2001, the Department received a permit application from Compliance Partners, Inc., on behalf of Bear Paw, requesting a Montana air quality permit modification to Permit #2736-05 and an operating permit modification to Permit #OP2736-00. The application requested to increase the facility's throughput from 4.2 MMScfd day to 8.5 MMScfd. The application was deemed complete upon submittal of additional information on October 12, 2001. The proposed alteration increased SO_2 emissions from 117.1 tons/year to 235.3 tons/year. The proposed 118.2 tons per year emission increase was below New Source Review (NSR) threshold levels and does not trigger Prevention of Significant Deterioration (PSD). This permit action increased the facility's throughput from 4.2 MMScfd to 8.5 MMScfd. Permit **#OP2736-01** replaced Permit #OP2736-00 and Permit **#2736-06** replaced Permit #2736-05.

On December 8, 2004, the Department received a letter from Bear Paw notifying the Department of a de minimis change at the Bear Paw facility. The de minimis change consisted of adding one depropanizer, two heat exchangers, 60,000 gallons of propane storage, and associated valves, flanges, pumps, etc. The current permit increased emissions from the facility by approximately 5.73 tons per year.

The proposed changes did not increase natural gas throughput of the facility; however, more gas liquids were captured in the depropanizer unit requiring the additional propane storage capacity and associated equipment.

The proposed changes triggered New Source Performance Standards (NSPS) 40 Code of Federal Regulations (CFR) 60, Subpart KKK, Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants.

Under the provisions of ARM 17.8.745, the permit action added one depropanizer, two heat exchangers, 60,000 gallons of propane storage, and associated valves, flanges, pumps, etc. The permit action also updated the permit to reflect current permit language and rule references used by the Department. **Permit #2736-07** replaced Permit #2736-06.

On May 21, 2002, the Department received a request to modify Permit #2736-06 and Permit #OP2736-01. The request was to switch the responsibilities of the 2 flares at the facility. The Department requested that Bear Paw submit a gas analysis for the facility because the calculations submitted for Department review used a hydrogen sulfide (H_2S) concentration lower than the concentration in the emission inventory of Permit #2736-06. On July 14, 2002, Bear Paw submitted a gas analysis for the facility demonstrating that the concentration of H_2S in the gas stream is 600 parts per million (ppm). The current permit action does not increase emissions from the facility. In fact, the gas analysis submitted to the Department demonstrated that SO_2 emissions from the facility decreased. Permit **#OP2736-02** replaced Permit #OP2736-01 and Permit **#2736-07** replaced Permit #2736-06.

On October 6, 2003, the Department received a request from Bear Paw for an administrative amendment of Permit #OP2736-02 to update Section V.B.3 of the General Conditions incorporating changes to federal Title V rules 40 CFR 70.6(c)(5)(iii)(B) and 70.6(c)(5)(iii)(C) (to be incorporated into Montana's Title V rules at ARM 17.8.1213) regarding Title V annual compliance certifications. Operating Permit **#OP2736-03** replaced #OP2736-02.

On January 20, 2004, the Department received a Title V renewal application from Bear Paw. The application was deemed administratively complete on January 27, 2004, and technically complete on February 19, 2004. Permit **#OP2736-04** replaced Permit #OP 2736-03.

D. Current Permit Action

On December 8, 2004, the Department received a letter from Bear Paw notifying the Department of a de minimis change at the Bear Paw facility. The de minimis change consisted of adding one depropanizer, two heat exchangers, 60,000 gallons of propane storage, and associated valves, flanges, pumps, etc. The current permit increased emissions from the facility by approximately 5.73 tons per year. The proposed changes triggered NSPS 40 CFR 60, Subpart KKK, Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants and is considered a significant modification in the Title V Program. Permit **#OP2736-04** replaces Permit #OP 2736-03.

E. Taking and Damaging Analysis

HB 311, the Montana Private Property Assessment Act, requires analysis of every proposed state agency administrative rule, policy, permit condition or permit denial, pertaining to an environmental matter, to determine whether the state action constitutes a taking or damaging of private real property that requires compensation under the Montana or U.S. Constitution. As part of issuing an operating permit, the Department is required to complete a Taking and Damaging Checklist. As required by 2-10-101 through 105, MCA, the Department has conducted a private property taking and damaging assessment and has determined there are no taking or damaging implications. The checklist was completed on March 24, 2005.

F. Compliance Designation

The Baker Gas Plant was last inspected on December 11, 2003. During the inspection, the Baker Gas Plant was in compliance with applicable permit requirements contained in Permit #OP2736-03 and Permit #2736-07. At the time of this permit issuance, the Department believes this facility is in compliance with all applicable regulations and permit conditions.

SECTION II. SUMMARY OF EMISSION UNITS

A. Facility Process Description

The Baker Gas Plant receives natural gas from the Baker North Compressor Station and the south system inlet from the South Shell Field and the East Look Out Butte (Burlington) Field. Initial compression of the gas is accomplished with a 448-hp Waukesha compressor engine and an 800-hp Superior compressor engine. Both natural gas-fired engines are equipped with air to fuel ratio (AFR) controllers and catalytic converters. An additional 1250-hp of compression will be available upon construction completion of natural gas-fired engine(s) for boosting and/or refrigeration. This engine(s) will also be equipped with an AFR controller(s) and catalytic converter(s).

The compressed natural gas is then dehydrated through the glycol treating system to reduce the moisture content and to meet sales gas specifications for water dew point. The sweetened gas stream, which is relatively saturated with water vapor, is passed through a liquid desiccant, ethylene glycol (EG), prior to flowing to the sales line. The glycol dehydration unit is used to remove water from produced natural gas streams to prevent hydrate formation and corrosion in pipelines. EG is used because of its high affinity for water and low cost. The moisture-rich EG leaving the absorption dehydration contact tower is cycled through the regenerator. The heat produced by the glycol reboiler boils off the absorbed moisture in the EG, which is vented from the stripper column as water vapor.

EG also has a high affinity for aromatic compounds. In the absorption step of the dehydration process, EG removes, in addition to water, some benzene, toluene, ethyl benzene, and xylene (BTEX), and VOCs from the natural gas. The absorbed VOCs and BTEX are then separated from the glycol in the regenerator. The dehydrator regenerator off gases are routed to the Anderson Hot Oil Heater for thermal destruction, except when the heater is not operating. The flash separator off gases are routed to the inlet condensate knockout drum.

Any H_2S present in the incoming gas stream is removed by the amine sweetening unit. Approximately 8.5 MMScf per day of sweet gas flows from the amine sweetening contactor to the existing propane refrigeration areas. The rich amine, which absorbed the gas components (H_2S and carbon dioxide (CO_2), flows to the flash separator from the bottom of the suction. The rich amine flows to a preheater before going on to the regenerator. The regenerator uses a direct-fired reboiler to heat the rich amine solution burning off the absorbed acid gases. Acid gas leaving the regenerator overhead is burned continuously in the Challenger Flare. The additional Guyed Utility Flare is only used for emergency upset conditions. The Challenger Flare is continuously piloted with pipeline quality natural gas and is equipped with an autoignitor, while the Guyed Utility Flare is equipped with an electric spark igniter.

Lean amine, now stripped of acid gas, flows back through the lean/rich exchanger. This provides preheat to the rich amine going to the regenerator. The lean amine is further cooled in an aerial cooler then pumped back to the contactor.

The plant also serves as a fractionation plant. After being dehydrated and desulfurized, natural gas is brought into the plant and broken down into its components. The individual components are butane, propane, gasoline, and salable natural gas.

The VOC product loading at the Baker Gas Plant is operated under a vapor balance system. All VOC product loading to tank trucks is conducted using bottom loading. Vapor flash resulting from loadout operations is returned to the associated storage vessel to maintain vapor balanced emissions control. Upon completion of VOC product loadout, all lines used for loading are purged of VOC vapors. These VOC vapors are then routed to a flare for thermal destruction.

B. Emission Units and Pollution Control Device Identification

Emissions Unit ID	Description	Pollution Control Device/Practice
EU001	448-hp Waukesha Compressor Engine	Air-to-fuel ratio (AFR) controller and a non-selective catalytic reduction (NSCR) unit
EU002	800-hp White Superior Compressor Engine	AFR controller and a NSCR unit
EU004	Challenger Flare	None
EU005	Fugitive Emissions	None
EU006	Ethylene Glycol Regenerator Vent	None
EU007	Product Loading	None
EU008	Condensate/Natural gas storage tank	Fixed roof, vapor balance system, submerge filled and pressure/vacuum vent
EU009	Guyed Utility Flare	None
EU010	Compressor Engine(s), 1,250-hp	Catalytic converter for each engine
EU012	Amine Regenerator, 4.2 MMScf/d	Flare
EU013	Y-grade horizontal storage tanks	Pressurized tank, vapor balance system, submerge filled and pressure/vacuum vent
EU014	Propane horizontal storage tanks	Pressurized tank, vapor balance system, submerge filled and pressure/vacuum vent
EU015	Butane horizontal storage tanks	Pressurized tank, vapor balance system, submerge filled and pressure/vacuum vent
EU016	Natural gasoline storage tanks	Fixed roof, vapor balance system, submerge filled and pressure/vacuum vent
EU023	Methanol storage tank	Fixed roof, vapor balance system, submerge filled and pressure/vacuum vent

C. Categorically Insignificant Sources/Activities

Emissions Unit ID	Description
IEU01	Anderson-Baird Hot Oil Heater, 6.5 MMBtu/hr
IEU02	Amine Regenerator Heater, 2.3 MMBtu/hr
IEU03	Methyl Mercaptan Storage Tank, 67 gal
IEU04	Depropanizer Unit
IEU05	Two Heat Exchangers

SECTION III. PERMIT CONDITIONS

A. Emission Limits and Standards

The combined emissions from all compressor engine(s) comprising the 1,250-hp, shall not exceed the following: NO_X - 5.51 lb/hr, CO - 5.51 lb/hr, VOC - 2.76 lb/hr.

The 448-hp Waukesha compressor engine shall not exceed the following: NO_X -1.98 lb/hr, CO -2.96 lb/hr, VOC - 1.00 lb/hr.

The 800-hp White Superior compressor engine shall not exceed the following: NO_X - 3.53 lb/hr, CO - 5.29 lb/hr, VOC - 1.76 lb/hr.

All compressor engines will be operated with an AFR controller and a NSCR unit.

Bear Paw shall route the dehydrator regenerator off gases to the Anderson Hot Oil heater for thermal destruction.

The VOC product loading and receiving at the Baker Plant shall be operated under a vapor balance system. All VOC product loading to tank trucks shall be conducted using bottom loading. Vapor flash resulting from loadout operations shall be returned to the associated storage vessel to maintain vapor balanced emissions control. Upon completion of VOC product loadout, all lines used for loading shall be purged of VOC vapors. These VOC vapors shall be routed to a flare for thermal destruction.

Bear Paw shall use fixed roof tanks for storage of natural gasolines and pressurized tanks for storage of re-run, propane and butane. The fixed roof tanks shall be vapor balanced, submerge filled and equipped with a pressure/vacuum vent. The pressurized tanks shall be vapor balanced, submerge filled, and equipped with a pressure/vacuum vent.

Each flare has an opacity limit of 10% and a particulate limit of 0.10 grains per dry standard cubic foot (gr/dscf) corrected to 12% CO_2. Bear Paw shall install and continuously operate a thermocouple and an associated recorder or any equivalent device to detect the presence of a flame on each flare.

The Baker Gas Plant has maximum production rate limit of 3,102.5 MMScf during any rolling 12-month period.

All stack emission from the amine regenerator shall be routed to the Challenger flare. The reporting, recordkeeping and notification requirements contained in 40 CFR 60, Subpart LLL are applicable to the amine unit. However, Because Bear Paw has demonstrated having a design capacity less than 2 long tons per day of H_2S in the acid gas (expressed as sulfur), only 40 CFR 60.647(c) is applicable to the facility.

B. Monitoring Requirements

ARM 17.8.1212(1) requires that all monitoring and analysis procedures or test methods required under applicable requirements are contained in operating permits. In addition, when the applicable requirement does not require periodic testing or monitoring, periodic monitoring must be prescribed that is sufficient to yield reliable data from the relevant time period that is representative of the source's compliance with the permit.

The requirements for testing, monitoring, recordkeeping, reporting, and compliance certification sufficient to assure compliance do not require the permit to impose the same level of rigor for all emission units. Furthermore, they do not require extensive testing or monitoring to assure compliance with the applicable requirements for emission units that do not have significant potential to violate emission limitations or other requirements under normal operating conditions. When compliance with the underlying applicable requirement for an insignificant emissions unit is not threatened by lack of regular monitoring and when periodic testing or monitoring is not otherwise required by the applicable requirement, the status quo **(i.e., no monitoring)** will meet the requirements of ARM 17.8.1212(1). Therefore, the permit does not include monitoring for insignificant emission units.

The permit includes periodic monitoring or recordkeeping for each applicable requirement. The information obtained from the monitoring and recordkeeping will be used by the permittee to periodically certify compliance with the emission limits and standards. However, the Department may request additional testing to determine compliance with the emission limits and standards.

Overall, Permit #OP2736-05 requires monitoring of emission units by way of inspections and maintenance on both uncontrolled emitting units and existing control equipment. Log entries indicating performance of any required inspections or maintenance will demonstrate compliance with the monitoring requirement.

C. Test Methods and Procedures

The operating permit may not require testing for all sources if routine monitoring is used to determine compliance, but the Department has the authority to require testing if deemed necessary to determine compliance with an emission limit or standard. In addition, the permittee may elect to voluntarily conduct compliance testing to confirm its compliance status.

D. Recordkeeping Requirements

The permittee is required to keep all records listed in the operating permit as a permanent business record for at least five years following the date of the generation of the record.

E. Reporting Requirements

Reporting requirements are included in the permit for each emissions unit and Section V of the operating permit "General Conditions" explains the reporting requirements. However, the permittee is required to submit semi-annual and annual monitoring reports to the Department and to annually certify compliance with the applicable requirements contained in the permit. The reports must include a list of all emission limit and monitoring deviations, the reason for any deviation, and the corrective action taken as a result of any deviation. The information required in 40 CFR 60.647(c) is required to be kept on file for the life of the facility.

F. Public Notice

In accordance with ARM 17.8.132, a public notice was published in the *Fallon County Times* newspaper on or before March 25, 2005. The Department provided a 30-day public comment period on the draft operating permit from March 25, 2005, to April 25, 2005. ARM 17.8.1232 requires the Department to keep a record of both comments and issues raised during the public participation process. There were no comments received regarding the permit action.

SECTION IV.   NON-APPLICABLE REQUIREMENT ANALYSIS

Bear Paw did not identify any ARM or Federal Regulations as not applicable to the facility or to any specific emissions unit at the time of the operating permit renewal (ARM 17.8.1214). Bear Paw must still comply with any new requirements that may become applicable during the permit term.

SECTION V. FUTURE PERMIT CONSIDERATIONS

A. NESHAP/MACT Standards

National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities (40 CFR Part 63 Subpart HH) and National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities (40 CFR Part 63 Subpart HHH) were promulgated June 17, 1999. As of the issuance date of Permit #OP2736-05, neither Subpart HH nor Subpart HHH is applicable to the facility because the facility does not meet the definition of a major source as defined in each Subpart.

B. NSPS Standards

As of the issuance date of Permit #OP2736-05, the only 40 CFR Part 60, Subpart LLL and KKK are applicable. However, because Bear Paw has demonstrated that the design capacity of the facility is less than 2 long tons/day of H_2S in the acid gas (expressed as sulfur), of Subpart LLL, only 40 CFR 60.647(c) is applicable to the facility.

C. Risk Management Plan

If a facility has more than a threshold quantity of a regulated substance in a process, the facility must comply with 40 CFR 68 requirements no later than June 21, 1999; three years after the date on which a regulated substance is first listed under 40 CFR 68.130; or the date on which a regulated substance is first present in more than a threshold quantity in a process, whichever is later.

As of the issuance date of Permit #OP2736-05, this facility exceeded the minimum threshold quantities for regulated substance(s) listed in 40 CFR 68.115. Consequently, this facility was required to submit a Risk Management Plan no later than June 21, 1999. A copy of the risk management plan is available from the EPA upon request.